REMARKS

Applicants thank the Examiner for the very thorough consideration given the present application. Claims 1 and 3-16 are now present in the application. Claims 11-15 were withdrawn from consideration by the Examiner. Of the claims under consideration by the Examiner, claims 1, 8 and 16 are independent.

Independent claims 1 and 8 have been amended. Reconsideration of this application, as amended, is respectfully requested. Favorable reconsideration and allowance of the present application are respectfully requested in view of the following remarks.

Allowable Subject Matter

Claim 16 has not been rejected or objected to and therefore becomes allowed by operation of 35 U.S.C. § 102. Applicants appreciate this indication of allowability.

Rejections under 35 U.S.C. § 103

Claims 1 and 3-6 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Publication No. 2002/0073923 to Saito et al. ("Saito") in view of U.S. Publication No. 2001/0029891 to Oh et al. ("Oh"). Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness and respectfully traverse the rejection.

In order to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), the cited references must teach or suggest each and every element in the claims. *See M.P.E.P. § 706.02(j); M.P.E.P. 2141-2144.*

With regard to the rejection of claims 1 and 3-6, while not conceding the appropriateness of the Examiner's rejection, but merely to advance prosecution of the instant application, Applicants respectfully submit that independent claim 1 has been amended to more clearly recite a substrate processing apparatus including a plasma generating device including a plasma introducing nozzle portion and a gas introducing nozzle portion, the plasma introducing nozzle portion and the gas introducing nozzle portion mounted in a space where said substrate is subjected to desired processing, and wherein the controller controls the post-processing gas supply unit to supply all of the reaction gases alternately from the exclusive supply nozzles during the post-processing

which occurs after the cleaning process in which the cleaning gas has been supplied, but has been left as residue. Neither Saito nor Oh, alone or in combination, suggest this combination of features, and therefore Applicants submit that claim 1, and the claims dependent thereon, are patentable over Saito in view of Oh.

More specifically, claim 1 requires a plasma generating device including a plasma introducing nozzle portion and a gas introducing nozzle portion, the plasma introducing nozzle portion and the gas introducing nozzle portion mounted in a space where said substrate is subjected to desired processing and a gas supply system controller which supplies a cleaning gas and then subsequently supplies post-processing gases for removing the undesirable elements remaining from the cleaning gases by alternately supplying all of the reaction gases from their exclusive supply nozzles. Saito has been discussed at length before, such as in the response filed August 5, 2008, which comments are incorporated herein. Saito does not show or suggest the use of a plasma generating device including a plasma introducing nozzle portion and a gas introducing nozzle portion, the plasma introducing nozzle portion and the gas introducing nozzle portion mounted in a space where said substrate is subjected to desired processing. In addition, the rejection appears to assert that because Saito teaches using one reaction gas as a post-processing cleaner, it would have been obvious to use them all. The rejection indicates Oh has been cited and applied to suggest this feature. Oh shows an atomic layer deposition (ALD) apparatus and process wherein very thin film layers (one atom thick) may be deposited by alternate application of an activated first material gas and a non-activated second material gas. Oh shows remote plasma generators 350a and 350b, but fails to show or suggest a plasma generating device including a plasma introducing nozzle portion and a gas introducing nozzle portion, the plasma introducing nozzle portion and the gas introducing nozzle portion mounted in a space where said substrate is subjected to desired processing. The Examiner points to paragraph [0080] of the reference in support of the motivation for alternately applying each of the post-processing gas supply units. A careful review of Oh reveals that it is alternately applying the deposition gases, not the post-processing gases which are applied after the cleaning gases but before substrates are placed in the container. Oh indicates in paragraph [0074] that it is possible to perform a cleaning step by introducing SF_6, which could correspond to the

instant claimed cleaning gas. But Oh does not even disclose a step after the cleaning process to remove cleaning process contaminants that result from cleaning, much less teach that such an additional step would include all reaction gases alternately supplied. Therefore, it is submitted that a teaching relating to the alternate application of film forming gases in an ALD apparatus does not reasonably suggest that alternate application of all of the chemical vapor deposition CVD reaction gases would serve to remove contaminants left from a cleaning gas. Moreover, Saito is directed to chemical vapor deposition processes where the reactant deposition gases must be mixed in order to achieve the reaction necessary to form the desired layer. It would appear that any attempt to alternately supply the reaction gases in Saito would destroy the CVD process. Finally, it is submitted that the only suggestion in the record, that alternate application of all reaction gases would solve the problem of leftover cleaning residue of HF cleaning gas, comes from Applicants' own disclosure. Reliance upon Applicants' own disclosure would, of course, be inappropriate. Therefore, it is respectfully submitted that the rejection under 35 U.S.C. § 103(a) does not teach or suggest each and every element of the claim and therefore should be withdrawn.

Claim 3 requires that each of the reaction gases supplied from the post-processing gas supply unit removes the element remaining in said exclusive supply nozzles and said reaction container, and the reaction gases form a desired film in said reaction container.

On page 6, the Examiner asserts that these are merely statements of intended use and states that the apparatus of Saito is capable of this intended use. To the contrary, it is respectfully submitted that these are functions that are a part of the claimed gas supply system and controller, and functions attributed to the claimed controller constitute positive limitations that must be met by the reference. Saito fails to disclose a controller that controls all of the reaction gases supplied from the post-processing gas supply unit to remove the elements remaining in the exclusive supply nozzles and the reaction container, and the reaction gases form a desired film in said container. Therefore, for this reason as well as the reason noted above with respect to claim 1, it is submitted that claim 3 is patentable over Saito in view of Oh. Claims 4-6 depend from claim 3, and it is submitted that these claims are also patentable at least for the same reasons as claims 1 and 3.

Claim 7 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Saito in view of Oh, and further in view of U.S. Patent No. 6,279,503 to Choi et al. ("Choi"). Choi is cited and applied for its teaching of using ClF_3 as a cleaning gas in a Chemical Vapor Deposition apparatus. Choi fails to show or suggest any of the missing features discussed above, and especially including a plasma generating device including a plasma introducing nozzle portion and a gas introducing nozzle portion, the plasma introducing nozzle portion and the gas introducing nozzle portion mounted in a space where said substrate is subjected to desired processing and the use of all of the reaction gases alternately supplied through their own exclusive supply nozzles during a post-processing process that occurs after the use of a cleaning gas to remove the cleaning contaminants before a new substrate is placed in the container. Therefore Choi cannot remedy the failure to teach such features with respect to claim 1.

Claims 8-10 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Saito in view of Oh, and further in view of Lam. Claims 8-10 recite a plasma producing unit including a plasma introducing nozzle portion and a gas introducing nozzle portion, the plasma introducing nozzle portion and the gas introducing nozzle portion mounted in a space where said substrate is subjected to desired processing, and a control apparatus for controlling the substrate processing apparatus such that cleaning gas is supplied from one of the supply nozzles into said reaction container at the time of cleaning, and all reaction gases used for processing a substrate are alternately supplied into said reaction container from the exclusive supply nozzles. According to the Office Action, Lam is cited to show the process 700 in Figure 13. Lam discloses the use of a substrate holder 20 which can serve as a plasma electrode, paragraph [0035], but Lam fails to show or suggest a plasma producing unit including a plasma introducing nozzle portion and a gas introducing nozzle portion, the plasma introducing nozzle portion and the gas introducing nozzle portion mounted in a space where said substrate is subjected to desired processing.

Neither Saito, Oh or Lam, alone or in combination, suggest a control apparatus for controlling the substrate processing apparatus such that a plasma producing unit including a plasma introducing nozzle portion and a gas introducing nozzle portion, the plasma introducing nozzle portion and the gas introducing nozzle portion mounted in a space where said substrate is subjected to desired processing and a cleaning gas is

supplied from one of the supply nozzles into said reaction container at the time of cleaning, and all reaction gases used for processing a substrate are alternately supplied into said reaction container from the exclusive supply nozzles. Therefore, for this reason it is submitted that claim 8, and claims 9 and 10 dependent thereon, is patentable over Saito in view of Oh and Lam.

It is noted that the Examiner has provided an extensive portion of the Office Action in response to arguments, for which Applicants are very appreciative. In particular *In re Fine* and *In re Jones* are cited in support of the notion that the combination or modification is appropriate as long as it is taught or suggested in the prior art or knowledge generally available. Applicants do not disagree with these principles in general. But Applicants insist this particular modification is not taught in the applied prior art, as discussed in detail above, and the rejection fails to establish any facts that would have constituted knowledge generally available, and which would have motivated one to make the asserted modifications. The rejection further asserts that *In re Danly, In re Shreiber and Ex parte Masham* all support the concept that apparatus must be distinguished from the prior art in terms of structure rather than function. That is not what this case law says. This concept flies in the face of MPEP 2173.05(g) which makes clear that there is "nothing inherently wrong with defining an invention in functional terms." Moreover, these claims positively recite a "controller" and a "control apparatus" which performs very specific claimed functions which cannot properly be ignored.

Conclusion

All objections and rejections raised in the Office Action having been properly traversed and addressed, it is respectfully submitted that the present application is in condition for allowance. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Notice of same is earnestly solicited.

Prompt and favorable consideration of this Amendment is respectfully requested.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Paul T. Sewell, Registration No. 61,784, at (703) 205-8000, in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

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